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Volume 7 | Issue 1 Article 32

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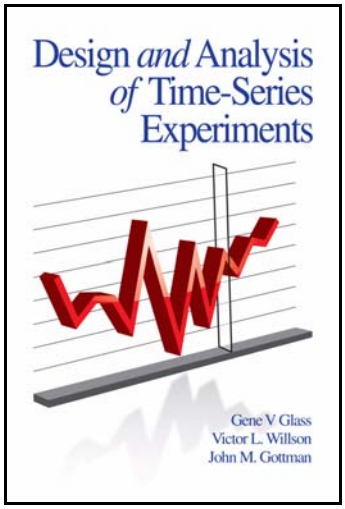
It's Back!

Design and Analysis of Time-Series Experiments

(with a new Introduction by the first author)



Gene V Glass, *Arizona State University*
Victor L. Willson, *Texas A&M University*
John M. Gottman, *The Gottman Institute, Seattle, Washington*

Hailed as a landmark in the development of experimental methods when it appeared in 1975, *Design and Analysis of Time-Series Experiments* is available again after several years of being out of print.

Gene V Glass, Victor L. Willson and John M. Gottman have carried forward the design and analysis of perhaps the most powerful and useful quasi-experimental design identified by their mentors in the classic Campbell & Stanley text *Experimental and Quasi-experimental Design for Research* (1966). In an era when governments seek to resolve questions of experimental validity by fiat and the label "Scientifically Based Research" is appropriated for only certain privileged experimental designs, nothing could be more appropriate than to bring back the classic text that challenges doctrinaire opinions of proper causal analysis.

Glass, Willson & Gottman introduce and illustrate an armamentarium of interrupted time-series experimental designs that offer some of the most powerful tools for discovering and validating causal relationships in social and education policy analysis. Drawing on the ground-breaking statistical analytic tools of Box & Jenkins, the authors extend the comprehensive autoregressive-integrated-moving-averages (ARIMA) model to accommodate significance testing and estimation of the effects of interventions into real world time-series. Designs and full statistical analyses are richly illustrated with actual examples from education, behavioral psychology, and sociology.

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"…this book will come to be viewed as a true landmark. … [It] should stand the test of time exceedingly well." ~ James A. Walsh (*Educational & Psychological Measurement*, 1975)

"Ordinary least squares estimation is usually inapplicable because of autoregressive error…. Glass, Willson, and Gottman have assembled the best approach." ~Donald T. Campbell

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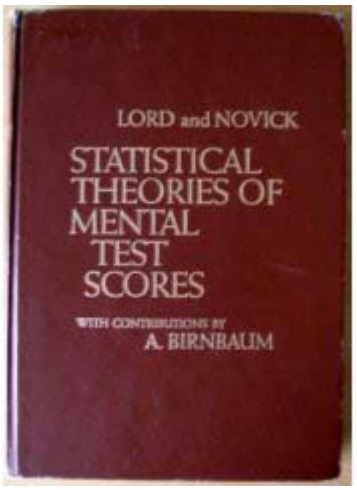
It's Back in Paperback!

Statistical Theories of Mental Test Scores

by **Frederic M. Lord** and **Melvin R. Novick**



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One of the most important books in the history of psychometrics has been virtually unavailable to scholars and students for decades. A gap in the archives of modern test theory is now being filled by the release in paperback for the first time of the classic text, *Statistical Theories of Mental Test Scores,* by the late and honored statisticians and psychometricians, Frederic M. Lord and Melvin R. Novick. No single book since 1968 when Lord & Novick first appeared has had a comparable impact on the practice of testing and assessment.

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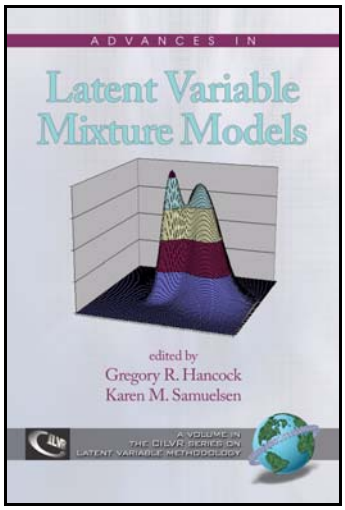
New Book Information

Advances in Latent Variable Mixture Models



Edited by **Gregory R. Hancock,** *University of Maryland, College Park,*
and **Karen M. Samuelsen,** *University of Georgia*

The current volume, *Advances in Latent Variable Mixture Models*, contains chapters by all of the speakers who participated in the 2006 CILVR conference, providing not just a snapshot of the event, but more importantly chronicling the state of the art in latent variable mixture model research. The volume starts with an overview chapter by the CILVR conference keynote speaker, Bengt Muthén, offering a "lay of the land" for latent variable mixture models before the volume moves to more specific constellations of topics. Part I, *Multilevel and Longitudinal Systems*, deals with mixtures for data that are hierarchical in nature either due to the data's sampling structure or to the repetition of measures (of varied types) over time. Part II, *Models for Assessment and Diagnosis*, addresses scenarios for making judgments about individuals' state of knowledge or development, and about the instruments used for making such judgments. Finally, Part III, *Challenges in Model Evaluation*, focuses on some of the methodological issues associated with the selection of models most accurately representing the processes and populations under investigation. It should be stated that this volume is not intended to be a first exposure to latent variable methods. Readers lacking such foundational knowledge are encouraged to consult primary and/or secondary didactic resources in order to get the most from the chapters in this volume. Once armed with that basic understanding of latent variable methods, we believe readers will find this volume incredibly exciting.

CONTENTS: Editors' Introduction, *Gregory R. Hancock and Karen M. Samuelsen.* Acknowledgments. Latent Variable Hybrids: Overview of Old and New Models, *Bengt Muthén.* **PART I: Multilevel and Longitudinal Systems.** Multilevel Mixture Models, *Tihomir Asparouhov and Bengt Muthén.* Longitudinal Modeling of Population Heterogeneity: Methodological Challenges to the Analysis of Empirically Derived Criminal Trajectory Profiles, *Frauke Kreuter and Bengt Muthén.* Examining Contingent Discrete Change Over Time with Associative Latent Transition Analysis, *Brian P. Flaherty.* Modeling Measurement Error in Event Occurrence for Single, Non-Recurring Events in Discrete-Time Survival Analysis, *Katherine E. Masyn.* **PART II: Models for Assessment and Diagnosis.** Evidentiary Foundations of Mixture Item Response Theory Models, *Robert J. Mislevy, Roy Levy, Marc Kroopnick, and Daisy Rutstein.* Examining Differential Item Functioning from a Latent Mixture Perspective, *Karen M. Samuelsen.* Mixture Models in a Developmental Context, *Karen Draney, Mark Wilson, Judith Glück, and Christiane Spiel.* Applications of Stochastic Analyses for Collaborative Learning and Cognitive Assessment, *Amy Soller and Ron Stevens.* The Mixture General Diagnostic Model, *Matthias von Davier.* **PART III: Challenges in Model Evaluation.** Categories or Continua? The Correspondence Between Mixture Models and Factor Models, *Eric Loken and Peter Molenaar.* Applications and Extensions of the Two-Point Mixture Index of Model Fit, *C. Mitchell Dayton.* Identifying the Correct Number of Classes in Growth Mixture Models, *Davood Tofighi and Craig K. Enders.* Choosing a "Correct" Factor Mixture Model: Power, Limitations, and Graphical Data Exploration, *Gitta H. Lubke and Jeffrey R. Spies.* About the Contributors.

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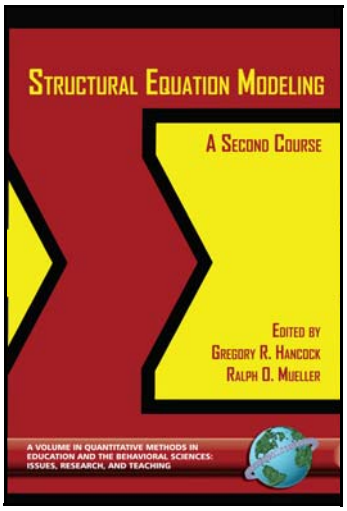

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This volume is intended to serve as a didactically-oriented resource covering a broad range of advanced topics often not discussed in introductory courses on structural equation modeling (SEM). Such topics are important in furthering the understanding of foundations and assumptions underlying SEM as well as in exploring SEM as a potential tool to address new types of research questions that might not have arisen during a first course. Chapters focus on the clear explanation and application of topics, rather than on analytical derivations, and contain syntax and partial output files from popular SEM software.

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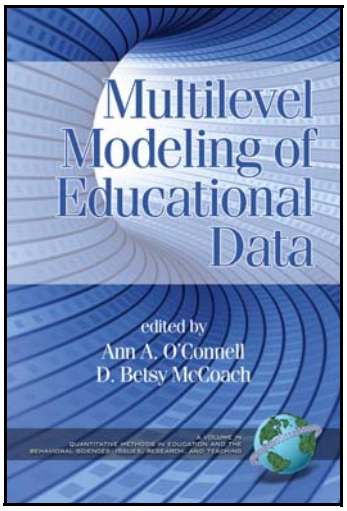

Edited by **Ann A. C'Connell,** *Ohio State University*
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A volume in **Quantitative Methods in Education and the Behavioral Sciences: Issues, Research, and Teaching**

Series Editor **Ron Serlin,** *University of Wisconsin*

(sponsored by the Educational Statisticians, SIG)

Multilevel Modeling of Educational Data, co-edited by Ann A. O'Connell, Ed.D., and D. Betsy McCoach, Ph.D., is the next volume in the series: *Quantitative Methods in Education and the Behavioral Sciences: Issues, Research and Teaching* (Information Age Publishing), sponsored by the Educational Statisticians' Special Interest Group (Ed-Stat SIG) of the American Educational Research Association. The use of multilevel analyses to examine effects of groups or contexts on individual outcomes has burgeoned over the past few decades. Multilevel modeling techniques allow educational researchers to more appropriately model data that occur within multiple hierarchies (i.e.- the classroom, the school, and/or the district). Examples of multilevel research problems involving schools include establishing trajectories of academic achievement for children within diverse classrooms or schools or studying school-level characteristics on the incidence of bullying. Multilevel models provide an improvement over traditional single-level approaches to working with clustered or hierarchical data; however, multilevel data present complex and interesting methodological challenges for the applied education research community.

In keeping with the pedagogical focus for this book series, the papers this volume emphasize applications of multilevel models using educational data, with chapter topics ranging from basic to advanced. This book represents a comprehensive and instructional resource text on multilevel modeling for quantitative researchers who plan to use multilevel techniques in their work, as well as for professors and students of quantitative methods courses focusing on multilevel analysis. Through the contributions of experienced researchers and teachers of multilevel modeling, this volume provides an accessible and practical treatment of methods appropriate for use in a first and/or second course in multilevel analysis. A supporting website links chapter examples to actual data, creating an opportunity for readers to reinforce their knowledge through hands-on data analysis. This book serves as a guide for designing multilevel studies and applying multilevel modeling techniques in educational and behavioral research, thus contributing to a better understanding of and solution for the challenges posed by multilevel systems and data.

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Journal of Modern Applied Statistical Methods
May, 2008, Vol. 7, No. 1, 2-367

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